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CORRIGENDUM: Fault-tolerant quantum computation with a soft-decision decoder for error correction and detection by teleportation

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The Supplementary Information of this Article contains errors. The physical-qubit interchanges are unnecessary in Figures S9 and S10. The correct Figures S9 and S10 appear below as Figures 1 and 2 respectively. In addition the figure legends of S9 and S10 should not contain the sentence "The qubit interchanges after the Hadamard gates come from the definition of the encoded Hadamard gate (see Fig. S1a)". Corresponding to this correction, in both the hard- and soft-decision decoding algorithms, the definition of the logical X gate, instead of the logical Z gate, is used for $\{m_{zj}; j=1, 2, \frac{1}{4}, 12\}$.

In addition the equations for the relative probabilities for $R_1^{(1)}(d_{x1}, d_{x2}, d_{z1}, d_{z2})$ and $R^{(2)}(d'_{x1}, d'_{x2}, d'_{z1}, d'_{z2})$ in Section IIIC ("Soft-decision decoding algorithm") contain errors.

In $R_1^{(1)}(d_{x1}, d_{x2}, d_{z1}, d_{z2})$:

$$\delta[l_{z1} + l_{z3} = d_{z1}] \delta[l_{z3} + l_{z4} = d_{z2}],$$

should read

$$\delta[l_{z1} + l_{z2} = d_{z1}] \delta[l_{z2} + l_{z4} = d_{z2}],$$

And in $R^{(2)}(d'_{x1}, d'_{x2}, d'_{z1}, d'_{z2})$:

$$\begin{aligned} &\times \delta[d_{x1} + d_{x3} + d_{x4} = d'_{x1}] \delta[d_{x4} + d_{x5} = d'_{x2}] \\ &\times \delta[d_{z1} + d_{z3} + d_{z4} = d'_{z1}] \delta[d_{z4} + d_{z5} = d'_{z2}]. \end{aligned}$$

should read

$$\begin{aligned} &\times \delta[d_{x3} + d_{x4} + d_{x6} = d'_{x1}] \delta[d_{x4} + d_{x5} = d'_{x2}] \\ &\times \delta[d_{z2} + d_{z3} = d'_{z1}] \delta[d_{z1} + d_{z3} + d_{z4} = d'_{z2}], \end{aligned}$$



Input

Output

Encoded Bell measurement with hard-decision decoders

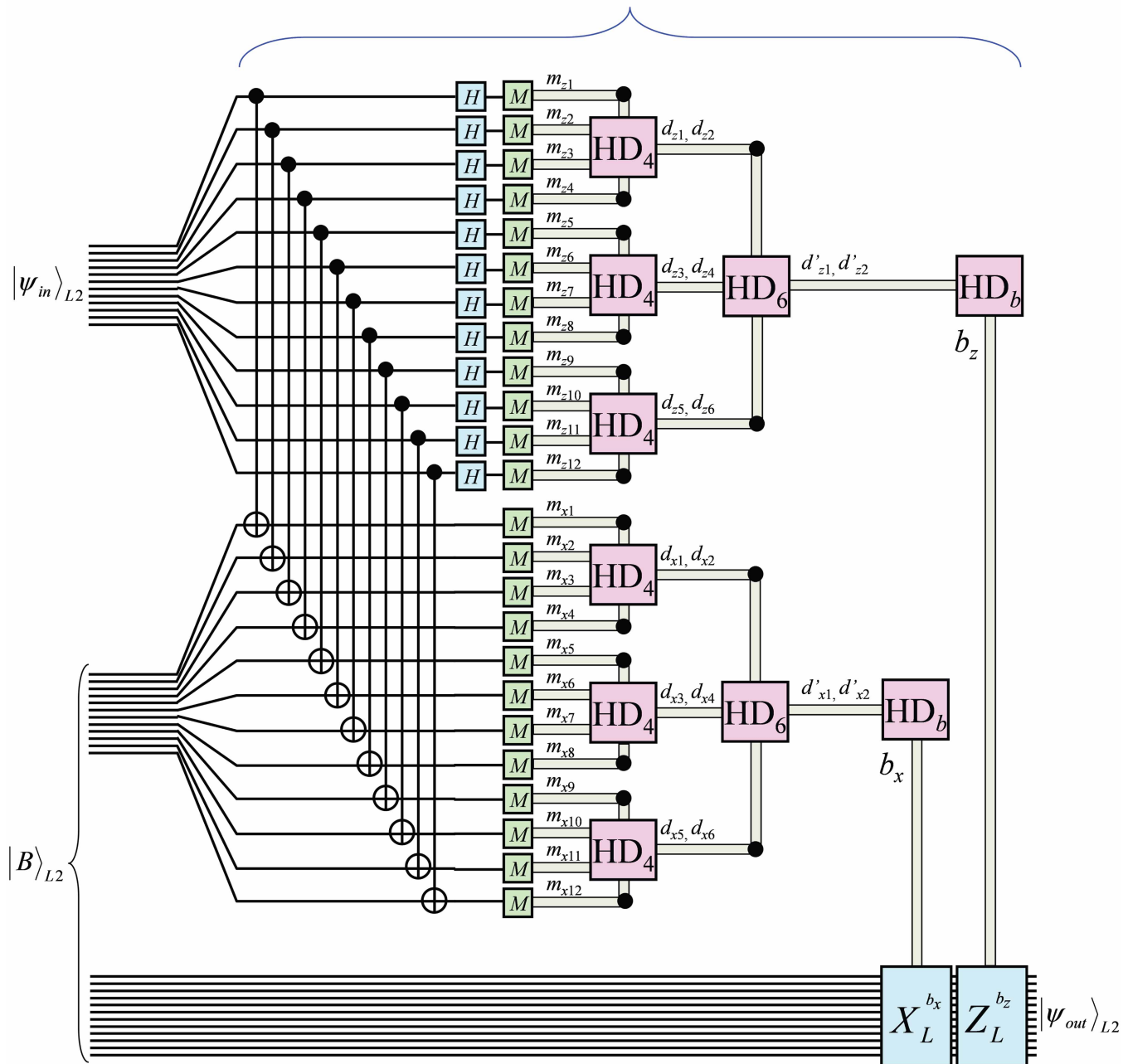


Figure 1 |



Input

Output

Encoded Bell measurement with soft-decision decoders

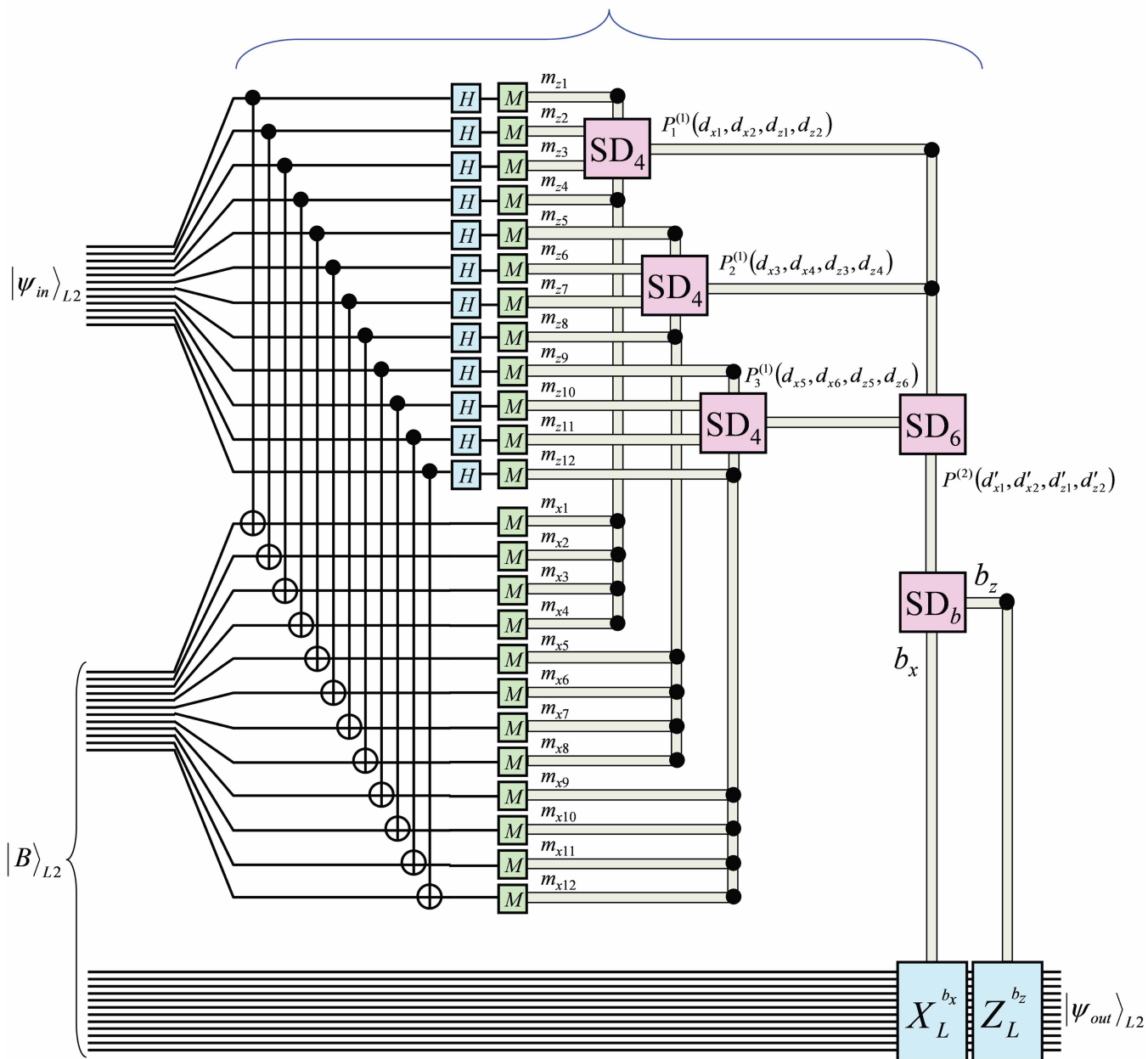


Figure 2 |